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REGENERATION SURVEY MANUAL

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DEPARTMENT OF LANDS & FORESTS
ALBERTA FOREST SERVICE
TIMBER MANAGEMENT BRANCH

One Milacre Plot

September, 1971 Edition

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Regeneration Survey Manual

September 1971

Errata

1) Section III B, Subsection (1) should read: Survey lines will be not more than four chains apart, evenly spaced, and parallel to each other.

2) Section III C, Subsection (4): Sentence added at the end of Subsection (4) should read: Only one plot shape (circular, square, or rectangular) may be used on any one cut block.

3) Section III C, Subsection (7) should read: Every fifth plot center will be clearly marked to facilitate checking.

4) Section III E, Subsection (3) is added to read: Record plot shape used on each cut block (circular, square, or rectangular).

Regeneration Surveys

September 1971

Introduction

A. Purpose: The purpose of a regeneration survey is to determine if adequate stocking has occurred on areas cut over under the terms of a specific timber disposition. Knowledge of satisfactory or unsatisfactory stocking will guide the timber harvester when determining his next course of action relative to reforestation. A standard regeneration survey will also provide a uniform basis to determine stocking percent for all those persons who have elected to accept the reforestation responsibilities.

B. Responsibilities: Under the Forests Act and the Quota System the licensee may elect to accept the responsibility of reforestation on a timber licence by an acceptable method of his choice. It will be his responsibility to conduct a regeneration survey to determine if the reforestation effort has been successful in terms of an adequate stocking percent. It is the responsibility of the licensee to provide maps and all necessary regeneration survey data showing the cutting blocks which are satisfactorily stocked. This information will be submitted to the Forest Officer along with the Annual Operating Plan. Personnel conducting the survey for the licensee must be approved by the Forest Officer in charge.

Regeneration Standards

A. Stocking

(1) A milacre plot is considered stocked if it contains one or more acceptable established seedlings as outlined in Section II C.

(2) An area will be considered satisfactorily stocked if 40% or more of the milacre plots are stocked with acceptable established coniferous seedlings or;

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(3) The area has 30% of the milacre plots containing acceptable established coniferous seedlings and up to 10% of the milacre plots contain acceptable established deciduous seedlings. Established balsam fir seedlings may be included in place of or along with the deciduous seedlings to make up 10% of the stocking. However, the remaining 30% must consist of acceptable established coniferous seedlings.

B. Established Seedling:

(1) In order to be considered established, a seedling must have grown on the area for three years. Where there are two seedlings on the plot which have grown on the area for two years, they may be considered together as a single established seedling.

(2) Established seedlings must show obvious health and vigor at the time of survey. Illustration I shows examples of one, two and three year old pine and spruce seedlings.

(3) Any live undamaged coniferous tree which existed on the site prior to logging may be counted as an established seedling. The tree must have apparent health and vigor and be young enough to remain live and merchantable until the rest of the established seedlings are logged.

C. Acceptable Species:

(1) Coniferous: Acceptable coniferous seedlings are White spruce, Engelman spruce, Black spruce, Lodgepole pine, Jack pine and Douglas fir. Balsam fir may be included as outlined in Section II A3.

(2) Deciduous: Acceptable deciduous seedlings are poplar and birch.

Survey Method

A. Baselines: Baselines will be established as guidelines for the survey lines as follows:

(1) Where feasible there should be two baselines, parallel to each other on opposite sides of the cutting block.

(2) Baselines may be located on roads, cut-lines, seismic lines, or cut-block boundaries of square or rectangular cut-blocks.

(3) On cutting blocks with slopes greater than 20% the baselines should be located so that the survey lines run across the drainage or up and down slope.

(4) Starting points for the survey lines will be marked at four chain intervals along the baseline. The nearest tree to a starting point will be blazed on four sides with the survey line number and direction of travel to be inscribed or written on the side facing the starting point. If there are no trees within six feet a stake will be driven into the ground at the starting point.

B. Survey Strips:

(1) Survey lines will be four chains apart and parallel to each other.

(2) Survey lines will be tied to both baselines to provide accurate plotting on maps.

C. Plots:

(1) Plot size for regeneration surveys will be one milacre (1/1000 acre). The plot may be:

(2) circular with a radius of 3.7 feet and the center of the circle and the plot center being a common point or;

(3) a square with 6.6 feet on a side, the center of the square and the plot center being a common point and two sides parallel to the survey line, or;

(4) a rectangle with the dimensions 11.0 feet by 4.0 feet and the center of the rectangle and the plot center being a common point. A rectangular

plot will be laid out so that the long axis of the rectangle is perpendicular to the survey line.

Illustration II, attached, shows the proper layout of the three plot shapes.

(5) The first plot along the survey line will be at least one chain from the cutting block boundary. The remaining plots along the strip will be two chains apart. Survey lines should be located so that they are at least one chain from any part of a cutting block boundary.

(6) The plots will be numbered consecutively with the plot number written on the map at the plot center. The corresponding number will be used for recording and mapping.

(7) Every fourth plot center will be clearly marked to facilitate checking.

D. Compilation and Results:

(1) The total plot area of a cutting block must be at least 0.12% of the total area of that block. On this basis an average of at least 1.2 plots per acre is required.

(2) If the computed stocking percent, as determined by the procedure in Section II and Sub-Section (1) above, is between 30% and 50% additional plots will be required to substantiate the reliability of the sample. To increase the sample intensity additional survey lines will be laid out mid-way between the existing survey lines. The result will be survey lines at two chain intervals with an average of at least 2.4 plots per acre. This procedure will be required prior to acceptance and approval of the regeneration survey by the Department of Lands and Forests.

(3) If the survey shows that an area of 10 acres or larger within a cutting block is satisfactorily stocked by the standards outlined in Section II it may be mapped and deleted from the remaining unsatis-

factorily stocked area. The remaining area will require treatment. Conversely, if a non-stocked area within a cutting block is larger than (a) 10 acres or (b) 20% of the total cutting block area, whichever is the smaller area, the area will be deleted from the stocked area and will require treatment.

E. Recording:

(1) Plot data will be recorded by the plot number corresponding to the number on the map at each plot center.

(2) Symbols for acceptable established seedlings and stocking are as follows:

Coniferous	Deciduous
Sw - White Spruce	A - Aspen, Poplar
Sb - Black Spruce	B - Birch
Pl - Lodgepole Pine	
Pj - Jackpine	**Stocking**
Df - Douglas fir	
Fb - Balsam Fir	SR - Satisfactorily stocked
	NSR - Unsatisfactorily stocked

For unsatisfactorily stocked plots the letters NSR will be placed after the plot number. For satisfactorily stocked plots the letters SR will be placed after the plot number followed by the symbol for the acceptable established coniferous seedlings found on the plot. For plots satisfactorily stocked with acceptable established balsam fir or deciduous seedlings the recording procedure will be the same as for coniferous seedlings.

F. Mapping:

(1) A map or diagram of the survey will be drawn to scale and include the following items:

(a) section, township, range and meridian

(b) scale - 1 inch = 5 chains

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(c) north arrow

(d) baselines

(e) directional arrows on strip lines

(f) a plot number on every fifth plot

(g) small red circles for satisfactorily stocked plots

(h) small blue circles for unsatisfactorily stocked plots

(i) mapped boundaries of stocked and/or non-stocked areas on a block where they may be deleted in accordance with Sub Section III D3.

A diagram illustrating a plotted survey is shown in Illustration III attached.

ILLUSTRATION I

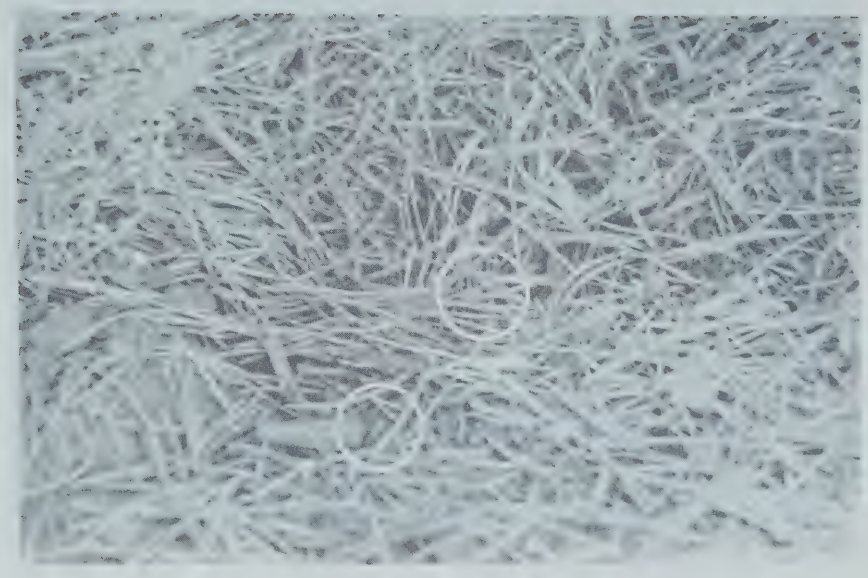


Fig. 1 One year old lodgepole pine seedlings growing naturally. They are unacceptable as established seedlings.

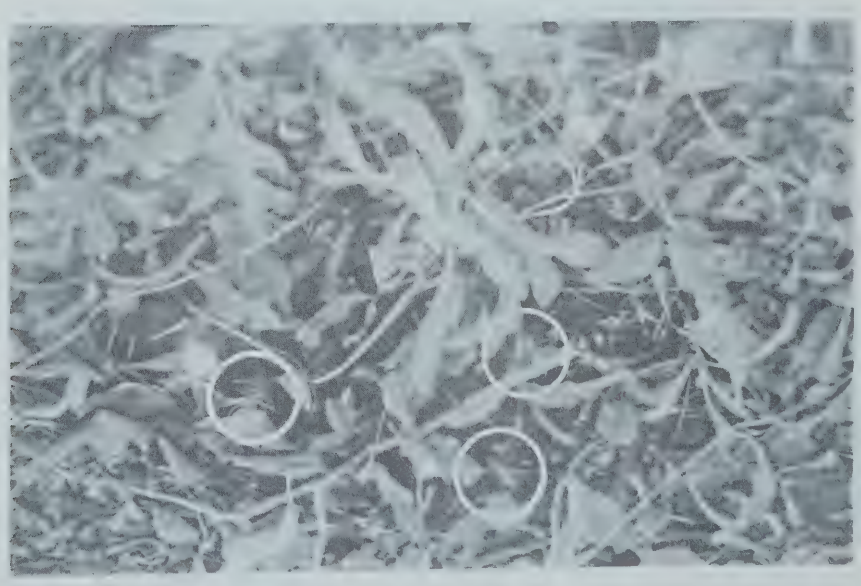


Fig. 2 One year old white spruce seedlings growing naturally, also unacceptable as established seedlings.

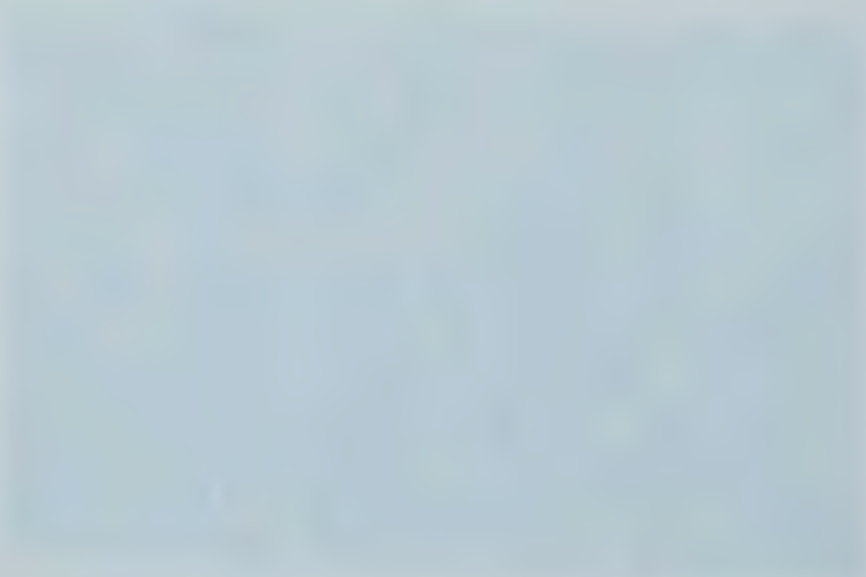


ILLUSTRATION I

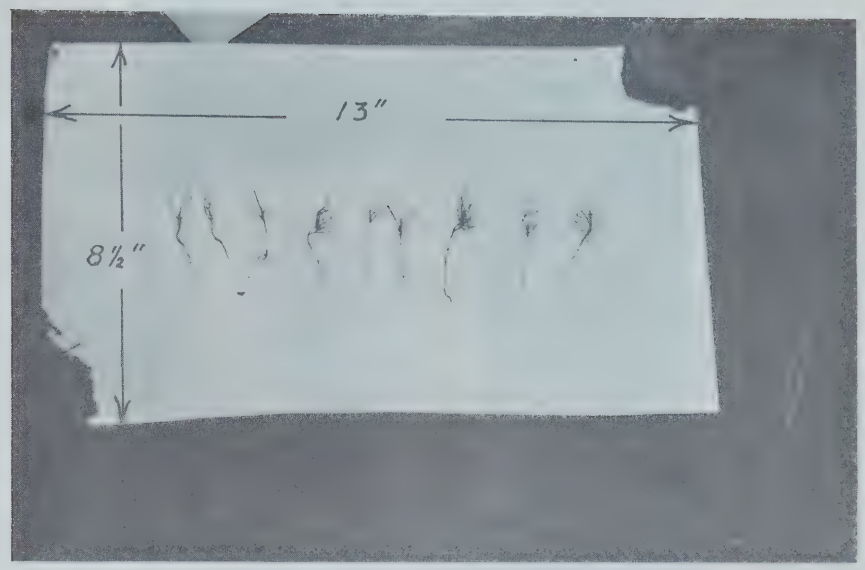


Fig. 3 Bare root one year old lodgepole pine seedlings. They are unacceptable as established seedlings.

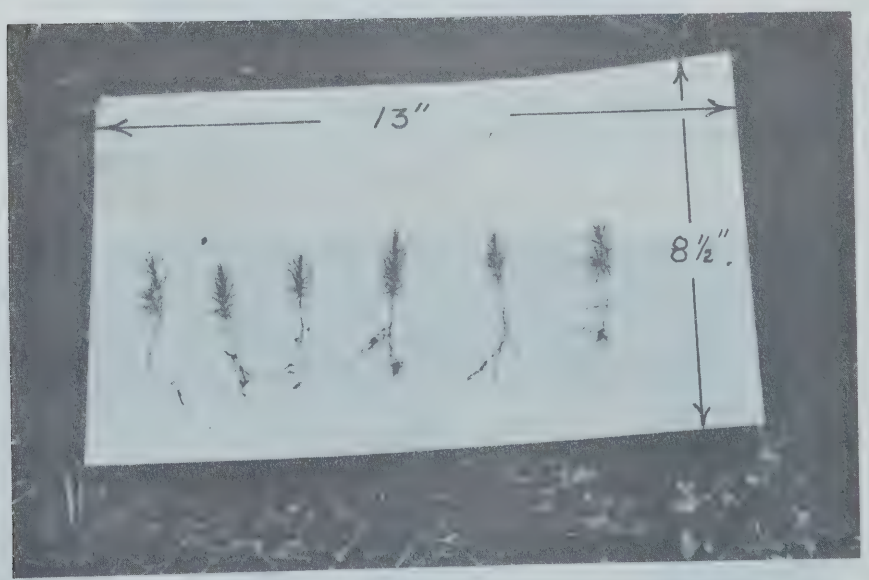


Fig. 4 Bare root one year old white spruce seedlings, also unacceptable as established seedlings.

Fig. 5 A bare root two year old (2-0) lodgepole pine seedling. Two 2-0 seedlings in a plot are acceptable as one established seedling.

Fig. 6 Bare root two year old (2-0) white spruce seedlings. Two 2-0 seedlings in a plot are acceptable as one established seedling.

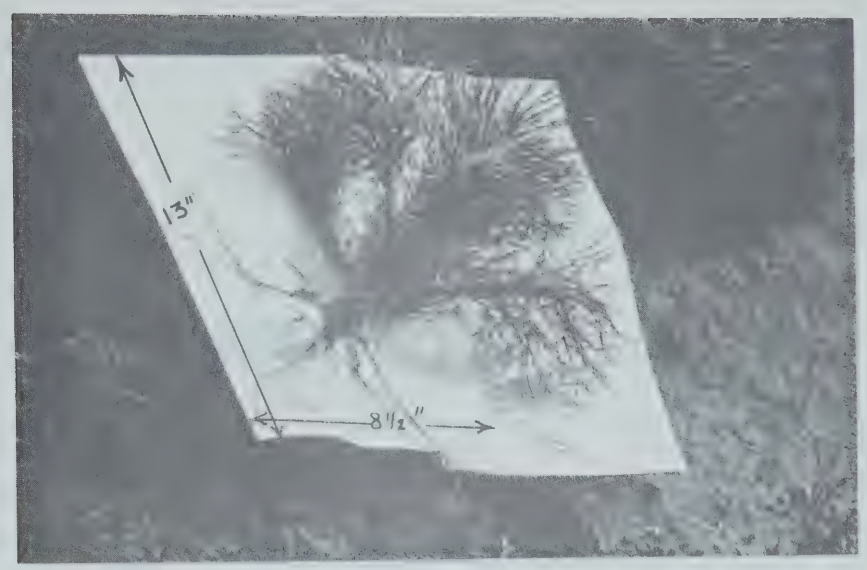


Fig. 7 A bare root three year old (3-0) lodgepole pine seedling. One 3-0 seedling per plot is acceptable as an established seedling.

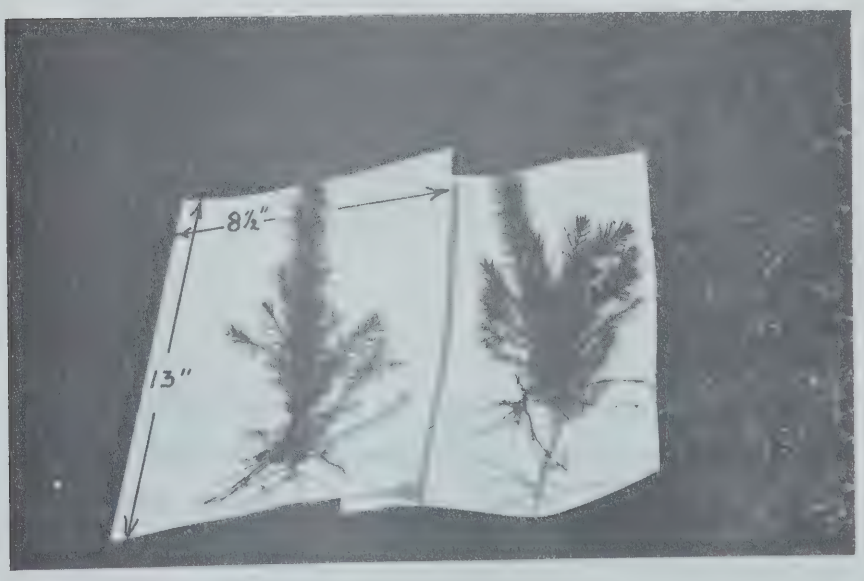


Fig. 8 Bare root three year old (3-0) white spruce seedlings. One 3-0 seedling per plot is acceptable as an established seedling.

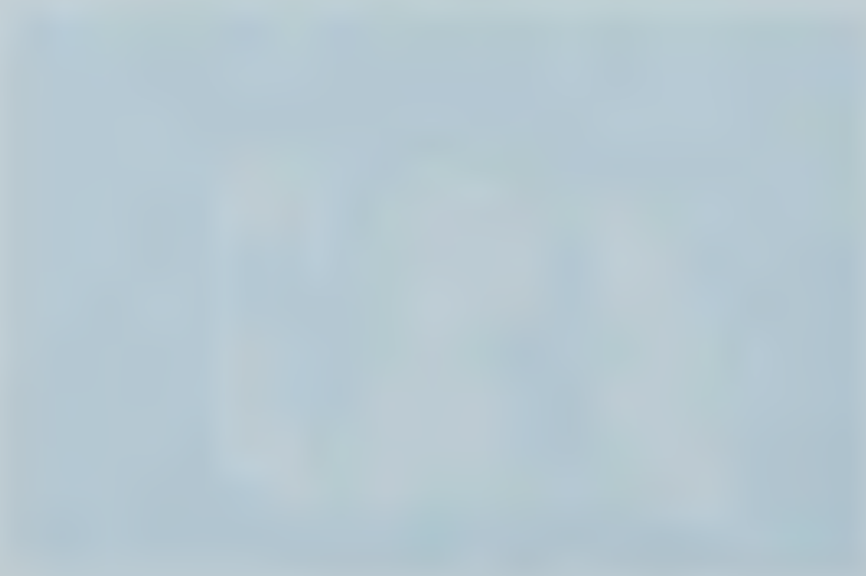
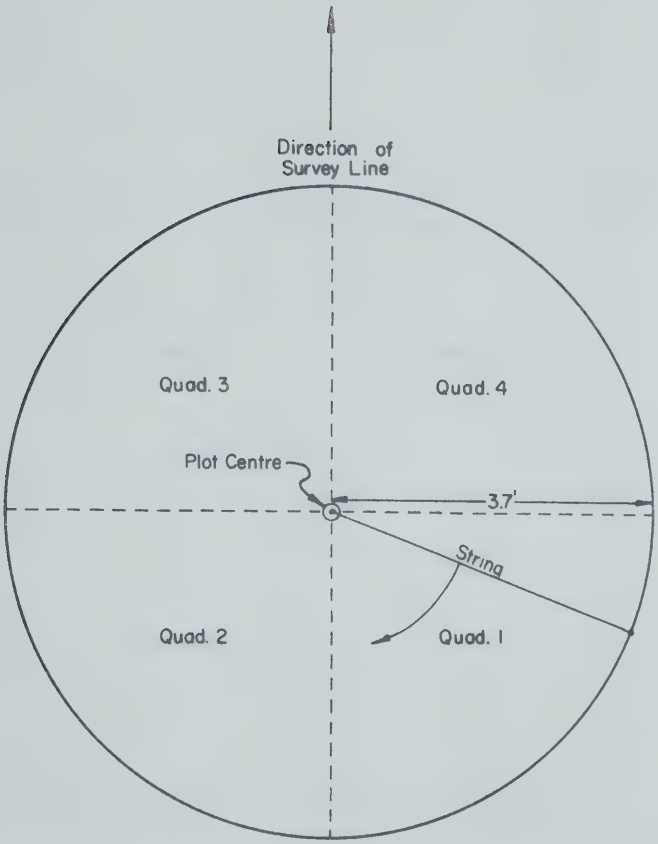


ILLUSTRATION IIa

Circular Milacre Plot

Scale: 1 inch = 2 feet

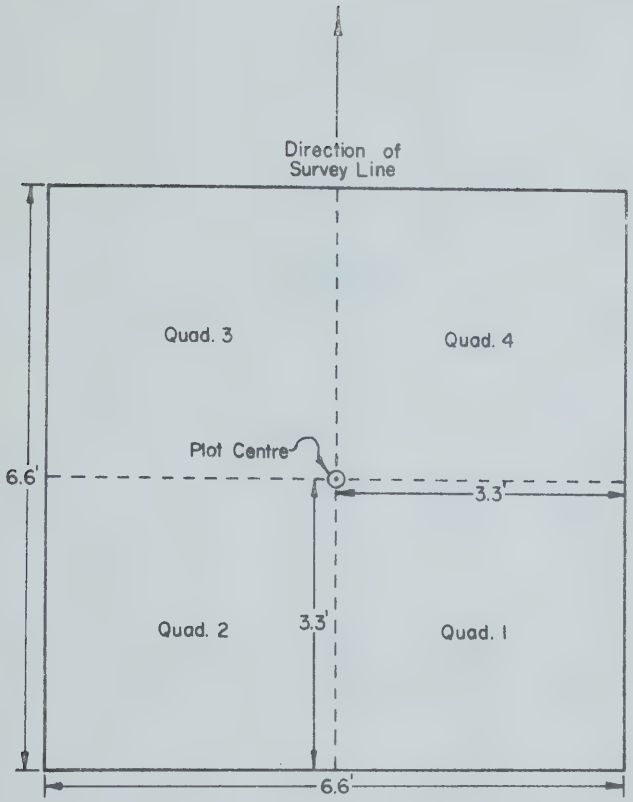


Plot divided into quadrants with the plot centre and the centre of the circle being a common point. A string 3.7 feet long may be extended from plot centre to plot perimeter to determine if established seedlings are "in" or "out" of the plot.

ILLUSTRATION IIb

Square Milacre Plot

Scale: 1 inch = 2 feet

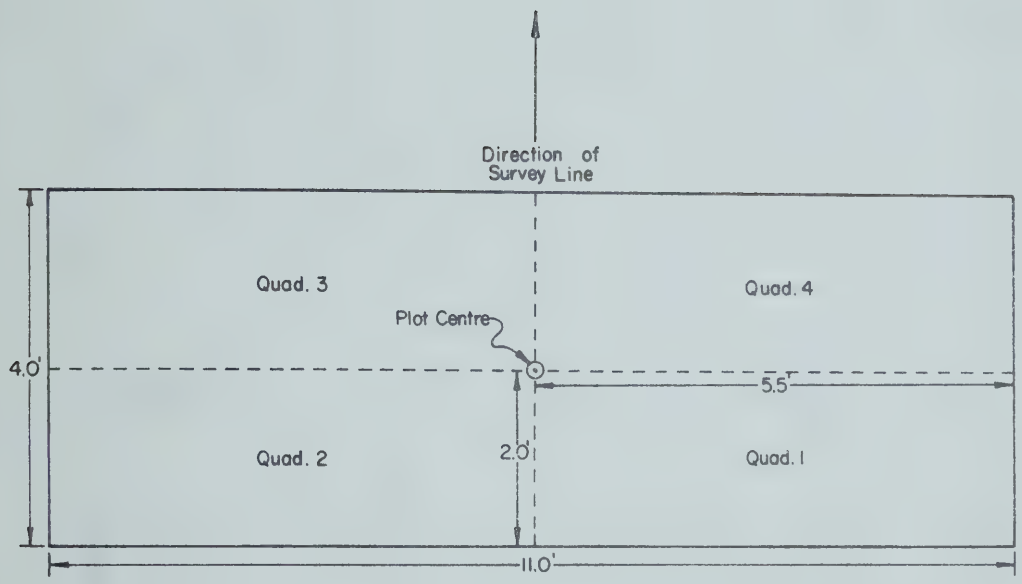


Plot divided into quadrants for ease of locating and/or counting established seedlings. Two sides are parallel to survey line. Plot centre and centre of square are a common point.

ILLUSTRATION IIc

Rectangular Milacre Plot

Scale: 1 inch = 2 feet



Plot divided into quadrants with long axis of plot perpendicular to survey line. Plot centre and centre of rectangle are a common point.

ILLUSTRATION III

Regeneration Survey Map

Sec. 32, Twp. 52, Rge. 24, W. 4 Mer.
Scale: 1 inch = 5 chains
July 15, 1970